

Borough of Chambersburg Storm Sewer Utility Feasibility Report



Prepared for Town Council by

Jeffrey Stonehill

Borough Manager/Director of Utilities

Phil Wolgemuth

Assistant to the Borough Manager/
Land Use & Development Director

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INTRODUCTION

This report was prepared to provide information to Town Council in order to consider adoption of a storm sewer utility as a potential funding mechanism for the Borough of Chambersburg stormwater management program. In doing so, it is important to define stormwater management and associated regulations, stormwater management program needs, and the factors driving the need for a storm sewer utility.

WHAT IS STORMWATER AND HOW IS IT REGULATED?

The Borough – located in the Conococheague Creek Watershed – regulates stormwater according to a Stormwater Management Ordinance adopted by Town Council on June 20, 2004 and amended on July 14, 2014. The Ordinance was originally drafted and adopted according to the Act 167 Conococheague Creek Watershed Plan as approved by the Pennsylvania Department of Environmental Protection (DEP) on November 10, 2003.

The Ordinance defines stormwater as drainage runoff from the surface of the land resulting from precipitation or snow or ice melt. Runoff is considered to be any part of precipitation that flows over the land surface.

According to the Ordinance, the Borough finds that:

- A. Inadequate management of accelerated stormwater runoff resulting from development throughout a watershed increases flood flows and velocities, contributes to erosion and sedimentation, overtaxes the carrying capacity of existing streams and storm sewers, greatly increases the cost of public facilities to convey and manage stormwater, undermines floodplain management and flood reduction efforts in upstream and downstream communities, reduces groundwater recharge, threatens public health and safety and increases pollution of water resources.
- B. A comprehensive program of stormwater management, including reasonable regulation of development, connections and discharges to the municipal separate storm sewer system (MS4), and activities causing accelerated erosion, is fundamental to the public health, safety, welfare and the protection of the people of the Borough and all the people of the Commonwealth of Pennsylvania, their resources and the environment.
- C. Stormwater is an important water resource, which provides groundwater recharge for water supplies and base flow of streams, which also protects and maintains surface water quality.
- D. Federal and state regulations require the Borough to obtain a permit for stormwater discharges from its MS4 under the National Pollutant Discharge Elimination System (NPDES) program. As such, the Borough is required to enact, implement and enforce a prohibition of non-stormwater discharges to its MS4.

The purpose of the Ordinance is to promote public health, safety and welfare within the Borough by minimizing damages through provisions designed to:

- A. Manage accelerated runoff, erosion and sedimentation, scour, aggradation and degradation problems at their source by regulating activities that cause these problems.
- B. Utilize and preserve the existing natural drainage systems.
- C. Encourage recharge of groundwater where appropriate and prevent degradation of groundwater quality.
- D. Maintain existing flows and quality of streams and watercourses in the watershed.
- E. Preserve and restore the flood-carrying capacity of streams.

- F. Provide proper operation and maintenance of all stormwater management facilities and all stormwater management BMPs that are implemented within the Borough.
- G. Provide performance standards and design criteria for watershed-wide stormwater management and planning.
- H. Provide standards to meet NPDES permit requirements.
- I. Meet water quality requirements under state law to protect, maintain, reclaim and restore the existing and designated uses of the waters of the Commonwealth of Pennsylvania

Impervious cover that prevents the percolation of water into the ground is created when land is developed with buildings, driveways and parking lots. In those instances, to comply with the Ordinance, land developers must prepare a drainage plan describing permanent stormwater facilities to be constructed to manage on-site runoff created by the impervious cover.

Stormwater management facilities constructed to comply with the Ordinance often incorporate Best Management Practices – or BMPs – which are activities, structures, facilities, designs, measures, procedures and techniques used to control, maintain or improve the quantity and quality of surface runoff; to manage stormwater impacts from regulated activities; to meet state water quality requirements; and to promote groundwater recharge.

Examples of BMPs implemented in the Borough include detention basins, infiltration basins and trenches, pervious pavement with infiltration beds, rain gardens, street sweeping operations and vegetated swales.

MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) PERMIT

The Borough municipal separate storm sewer system (MS4) operates under NPDES General Permit No. PAG 133704, of which coverage commenced on August 1, 2013 and will expire at midnight on July 31, 2018.

The Borough storm sewer system is comprised of the following:

Number of catch basins: 1,983

Total length (feet or miles) of storm sewer pipes: 276,612 feet or 52.39 miles

Total length (feet or miles) of storm sewer open channels: 77,109 feet or 14.60 miles

Number of detention basins: 55

Number of subsurface detention areas: 13

Number of outfalls to Conococheague Creek and Falling Spring Creek: 108

The Borough encompasses 4,434.99 acres with approximately 2,555.47 acres (57.62%) of pervious area and approximately 1,879.52 acres (42.38%) of impervious cover. Of the impervious cover, approximately 571.67 acres (30.42%) is covered with buildings, approximately 401.62 acres (21.36%) is covered with streets (Borough, State Routes and private) and approximately 417.11 acres (22.19%) is covered with parking lots. The remaining 489.12 acres (26.03%) is covered with items such as sidewalks, concrete slabs, swimming pools and decks that were not incorporated into the previously noted categories.

The MS4 Permit requires the Borough to operate a stormwater management program to address the Minimum Control Measures that are described below along with an explanation of how the Borough currently addresses those measures. The Land Use and Development Department is responsible for all MS4 Permit compliance and reporting.

MCM 1. Public Education and Outreach on Stormwater Impacts – A Public Education and Outreach Program to include lists of target audience groups present within the areas served by the MS4, annual publication of at least one educational item about the stormwater management program and distribution of educational materials to target audiences.

The Borough's utility customer list is the target audience provided educational flyers as part of utility bill distribution. Educational materials are also available from the Borough website.

MCM 2. Public Involvement and Participation – Public Involvement and Participation Program to regularly solicit public involvement and participation from target audience groups, solicit public reporting of suspected illicit discharges and conduct public meetings to discuss the on-going implementation of the stormwater management program.

Town Council meetings are currently the only public forums used to discuss the stormwater management program.

MCM 3. Illicit Discharge Detection and Elimination – The Borough must maintain a map depicting the location of all outfalls and the locations and names of all surface waters that receive discharges from those outfalls. It must maintain a program for the detection, elimination and prevention of illicit discharges into the MS4, including dry weather field screening of outfalls for non-stormwater flows. It must enact a Stormwater Management Ordinance to implement and enforce a stormwater management program that includes prohibition of non-stormwater discharges to the MS4. It must also provide educational outreach to public employees, business owners and employees, property owners, the general public and elected officials about the program to detect and eliminate illicit discharges.

The Borough has a storm sewer system map and Stormwater Management Ordinance. Dry weather field screening is conducted annually by personnel from the Land Use and Development Department and Public Works Department. Illicit discharge investigations are conducted by the Land Use and Development Department.

MCM 4. Construction Site Stormwater Runoff Control – Provide a program for construction stormwater permitting, construction inspection, and enforcement of installation and maintenance of the necessary erosion and sediment control measures, including, but not limited to, coordination with DEP's NPDES Construction Stormwater Permitting program and enforcement of an ordinance to require the implementation of erosion and sediment control BMPs, as well as sanctions to ensure compliance. Implement requirements for construction site operators to control waste at the construction site that may cause adverse impacts to water quality as well as procedures for the receipt and consideration of public inquiries, concerns, and information submitted by the public regarding local construction activities.

The Franklin County Conservation District is responsible for this task according to a Memorandum of Understanding signed in 2009 for Erosion and Sediment Control Plan review/approval in conjunction with the Borough Land Development Plan approval process. Land Use and Development Department personnel participate in pre-construction meetings with Franklin County Conservation District and construction site operators.

MCM 5. Post-Construction Stormwater Management in New Development and Redevelopment – The Borough must enforce an ordinance to address post-construction stormwater runoff from new development and redevelopment projects, as well as sanctions and penalties associated with non-compliance, to the extent

allowable under State or local law. It must require the implementation of a combination of structural and/or non-structural BMPs that minimize water quality impacts, and that are designed to maintain pre-development runoff conditions. It must ensure adequate operation and maintenance of all post-construction stormwater management BMPs installed at all development or redevelopment projects. It must also develop and implement measures to encourage and expand the use of Low Impact Development in new and redevelopment.

The Borough regulates stormwater according to a Stormwater Management Ordinance. Land Use and Development Department personnel and a professional engineering consultant review all development projects for consistency with the Ordinance and enforce the Ordinance to ensure operation and maintenance of post-construction stormwater management BMPs.

MCM 6. Pollution Prevention and Good Housekeeping – The Borough must identify and document all facilities and activities that are owned or operated by the Borough and have the potential for generating stormwater runoff to the MS4. It must maintain an operation and maintenance program for all municipal operations and facilities that could contribute to the discharge of pollutants from the MS4. It must also develop and implement an employee training program that addresses appropriate topics to further the goal of preventing or reducing the discharge of pollutants from municipal operations to the MS4.

The Public Works Department maintains a pollution prevention program for all municipal vehicle/equipment operations, maintenance, fueling and washing facilities as well as Standard Operating Procedures for runoff associated with construction projects that involve street cutting. The department also oversees street sweeping, fall leaf collection, snow removal and inlet cleaning functions for Borough-owned streets. The Land Use and Development Department is currently addressing with DEP sediment control non-compliance at North Fourth Street along the Falling Spring Creek and a swale adjacent to Hollywell Avenue.

WHAT IS A STORM SEWER UTILITY?

A storm sewer utility is a revenue generating program that allows municipalities to better manage stormwater by creating a designated fund for stormwater management. Like a water or sewer utility, a storm sewer utility generates revenue through user fees that are based upon the amount of stormwater generated on a property. These fees are assessed by measuring the amount of impervious cover within a parcel, are determined by the financial needs of the municipality and can be adjusted over time to continually meet those needs. Storm sewer utilities are also drivers for physical change when they include a well-managed credit system. A credit system provides the opportunity for property owners to reduce their fee by disconnecting or reducing impervious cover and managing stormwater on-site.

A storm sewer utility provides a vehicle for:

- Consolidating or coordinating responsibilities that were previously dispersed among several departments.
- Generating funding that is adequate, stable, equitable and dedicated solely to managing stormwater.
- Developing programs that are comprehensive, cohesive and consistent year-to-year.

BENEFITS OF A STORM SEWER UTILITY

A storm sewer utility is a public utility established to provide stormwater management services. An important distinction between storm sewer utility fees and real estate taxes is that they are user based and are tied to stormwater management services provided by the utility, whereas taxes are not tied to specific services. For

example, the owner of a large business with acres of impervious pavement and greater impact to the stormwater system would pay more than the owner of a single-family residential parcel. Essentially, “the more you pave, the more you pay.”

The key rationales for establishing a storm sewer utility are:

- It is Stable – it is not as dependent on the vagaries of the annual budget process as taxes are.
- It is Adequate – the fee is based on a well thought out stormwater management program to meet the needs and demands of the community.
- It is Flexible – it can adapt to changing program and funding needs over time.
- It is Equitable – the cost is borne by the user on the basis of demand placed on the drainage system and receiving waters.

Other Benefits:

- Funds raised by the utility to manage stormwater are no longer needed from the General Fund, which is supported with real estate taxes.
- Tax exempt properties that do not contribute to the General Fund pay for costs of managing stormwater under a utility.
- Credits encourage positive change, including implementation of Best Management Practices.

CURRENT STORMWATER MANAGEMENT PROGRAM FUNDING

The Borough’s stormwater management program is currently financed from the General Fund with \$11,000 budgeted in 2014 from the Engineering Department for stormwater management engineering and \$114,000 budgeted from the Highway Department for maintenance of stormwater drains and \$14,000 allocated for cleaning storm drains. The street sweeping and leaf collection operations are funded through the Sanitation Enterprise Fund, with \$134,950 budgeted in 2014. These programs are managed by the Borough Manager, Land Use and Development Department, Public Works Department and Sanitation Department, with staffing costs being paid from the General Fund or Sanitation Enterprise Fund respectively.

All told, in 2014, the Borough budgeted less than \$300,000 to support a stormwater management program that is administratively complex based on MS4 Permit requirements and lacking appropriate data and funding to undertake a more successful maintenance operation and capital improvements program.

When considering maintenance alone, without personnel costs and capital improvements, it is interesting to compare the Borough storm sewer system and sanitary sewer collection system infrastructure and the amount of money budgeted in 2014:

Storm Sewer System:

52 miles of pipe length.

1,983 catch basins.

\$128,000 budgeted from the Highway Department for maintenance.

Sanitary Sewer System:

85 miles of pipe length.

2,246 manholes.

\$801,450 budgeted from the Sewer Department for maintenance.

With current financial resources allocated to the stormwater management program – and program administration dispersed amongst various departments – the Borough is struggling to comply with increasingly stringent MS4 Permit requirements and to properly maintain storm sewer system infrastructure. As such, we recommend that Town Council consider a storm sewer utility to regulate, manage, enforce and supervise publicly and privately owned stormwater management facilities as well as to respond effectively to regulatory requirements, proper planning and efficient allocation of municipal resources for ongoing storm sewer system maintenance.

WHY DO WE NEED A STORM SEWER UTILITY?

There are a number of drivers and compelling arguments that support the need for a storm sewer utility and a better stormwater management program. It is important to identify areas of the current program in need of change and to effectively convey that need to Town Council and the public. When considering a storm sewer utility, it is the stormwater management program that drives the funding need and therefore the utility fee.

The following drivers have prompted us to explore a more sustainable source of funding to meet increased stormwater management program needs. These drivers also present a compelling argument for why a storm sewer utility may make the most sense to fund current and future stormwater management program needs.

First, and most importantly, a storm sewer utility would provide personnel to be responsible for compliance with the MS4 Permit Minimum Control Measures:

MCM1. Public Education and Outreach on Stormwater Impacts – Storm sewer utility personnel would be charged with improving educational materials and devising other distribution methods.

MCM2. Public Involvement and Participation – Other methods for soliciting public involvement and participation would be investigated by storm sewer utility personnel.

MCM3. Illicit Discharge Detection and Elimination – Storm sewer utility personnel would conduct dry weather field screening and coordinate enforcement and educational outreach for illicit discharge detection and elimination.

MCM4. Construction Site Stormwater Runoff Control – Storm sewer utility personnel would coordinate with the Franklin County Conservation District.

MCM5. Post-Construction Stormwater Management in New Development and Redevelopment – Storm sewer utility personnel would take responsibility for these tasks and establish a proactive, systematic inspection program for privately-owned BMPs as well as develop and implement measures to encourage the use of Low Impact Development.

MCM6. Pollution Prevention and Good Housekeeping – A storm sewer utility would identify and document all facilities and activities that are owned and operated by the Borough that have the potential for generating stormwater runoff to the MS4 (such as the Borough Garage, Service Center, Recreation Department facilities, etc.) develop and implement maintenance activities/schedules and inspection procedures to reduce the potential for pollutants to reach the MS4 and institute an employee training program to ensure personnel understand and comply with storm sewer system maintenance and pollution prevention measures.

Secondly, beyond MS4 Permit administration, there are other important program components that would be addressed by a storm sewer utility:

- Evaluate storm sewer system maintenance needs and establish a capital improvement plan.
- Enforce the Floodplain Management Ordinance.
- Evaluate areas prone to flooding and established corrective measures.
- Implement the Chesapeake Bay Pollutant Reduction Plan, when approved by DEP.
- The Chesapeake Bay Pollutant Reduction Plan included an option to provide current loads of Nitrogen, Phosphorus and Sediment being discharged annually to receiving waters in the Chesapeake Bay Watershed. While this optional data was not provided with the plan, it is obvious such data will be required by DEP in the future. Storm sewer utility revenue could be used to hire an engineering firm experienced in stormwater monitoring and modeling within the Chesapeake Bay Watershed to establish a program to monitor and model stormwater system flow to the Conococheague Creek and Falling Spring Creek. This effort would provide actual nutrient and sediment load data to help the Borough determine whether BMPs implemented as a result of the Stormwater Management Ordinance are effective, to determine areas of the Borough where excessive amounts of nutrients and sediment are produced and to provide guidance and strategies to implement BMP's to address these problem areas.
- Could shift funding for the street sweeping, fall leaf removal and inlet cleaning functions from the General Fund to the storm sewer utility.
- Incorporate and enforce any future MS4 requirements such as Total Maximum Daily Load (TMDL), which is a calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards.

STORM SEWER UTILITY RATE STRUCTURE

It is essential to the success of a storm sewer utility that the rate structure be established to fit the financial and political needs of the municipality. Rate structures should be fair and justifiable while still bringing in enough revenue to adequately fund the stormwater management program. A well-funded and functioning stormwater management program is justification for the utility in and of itself. Rate structures directly impact the amount of revenue generated by the utility. Whether the utility charges everyone the same or charges properties with large areas of impervious cover higher fees, the structure chosen is one of the most important decisions to be made.

The utility rate structure component that describes how much each property pays is called a stormwater service fee. The stormwater service fee for the Borough storm sewer utility is proposed in three phases:

Phase 1: A monthly fee assessed for every sanitary sewer connection.

Phase 2: A monthly fee based on the impervious coverage for each parcel in relation to the demand for stormwater management services.

Phase 3: A credit system for BMPs to offset stormwater service fees.

PHASE 1

To properly establish a storm sewer utility and develop the administrative capacity and knowledge to determine the relative contribution of each parcel to the demand for stormwater management services, a monthly fee assessed for every sanitary sewer connection is recommended. We believe it is reasonable to assume that a

property with a sanitary sewer connection has been developed with impervious cover such as buildings, driveways and parking lots. At the time when this report was prepared, the Borough had 8,092 sanitary sewer connections that are billed a monthly supply charge. In most cases, the monthly supply charge is paid by the property owner unless all utility charges are made the responsibility of the tenant.

If a storm sewer utility is created, we propose a monthly stormwater service fee of \$3.00 per sanitary sewer connection. As such, based on 8,092 sanitary sewer connections, a monthly stormwater service fee of \$3.00 would cost each sanitary sewer connection customer \$36 per year and would generate \$291,312.00 for storm sewer utility start-up costs associated with personnel and administration.

In most cases, there is one sanitary sewer connection for each developed property street address; however, there are developed properties in the Borough with multiple sanitary sewer connections. For example, a single-family dwelling has one sanitary sewer connection that would be charged \$36 per year. A multi-family dwelling – also known as an apartment building – may accommodate 12 separate units, each with their own sanitary sewer connection that would be charged \$36 per year, for a total annual stormwater service fee of \$432.00 for that particular building.

To augment the fee established through Phase 1 until the Phase 2 fee is implemented, we propose continuing some amount of General Fund revenue associated with the Engineering Department for stormwater management engineering, the Highway Department for maintenance of stormwater drains and the Sanitation Enterprise Fund for street sweeping and leaf collection operations.

PHASE 2

As the administrative capacity of the storm sewer utility is solidified and the stormwater management program is improved, a monthly fee based on the actual impervious coverage for each parcel in relation to the demand for stormwater management services will be established.

Once established and operational, initial storm sewer utility budgets and costs, expected budget costs, expected costs of capital improvement projects and the necessary revenue for a successful stormwater management program can be evaluated to estimate a dollar amount for the total revenue that the utility will help finance.

The typical form of data analysis required to establish a storm sewer utility is an assessment of impervious cover for each parcel within the municipal boundary, excluding land within a street right-of-way. To accomplish this, an Equivalent Residential Unit (ERU) is calculated, which represents the amount of impervious cover in a typical residential parcel. The ERU is then used as the billing unit in relation to the annual revenue needs for the utility. Similar to the equivalent daily unit that is used for Borough water and sewer capital charges, we believe the ERU is an intuitively understood concept that would be acceptable to most ratepayers.

Thus, if a property has ten times the ERU measurement (e.g. ten times more impervious cover than the typical residential property), they would pay ten times the fee charged a typical residential property.

An accurate analysis of impervious cover is essential to develop a rational fee structure. In general terms, by using aerial photography and computer software, the amount of impervious cover for each parcel is calculated, parcels are sorted by residential and non-residential and an Equivalent Residential Unit (ERU) is calculated according to the median for all residential parcels in the database.

RATE STRUCTURE EXAMPLE

The following hypothetical example outlines a rate structure using a desired annual revenue of \$1 million for the storm sewer utility. The ERU is calculated to equal 2,500 square feet. A single-family or two-family dwelling is equivalent to one ERU, regardless of the amount of impervious cover. All other properties – including multi-family dwellings – are charged ERUs according to the impervious area for that particular property. The fee per ERU is determined by dividing the total desired annual revenue for the storm sewer utility by the total ERUs, in this case 310,000.

Area of Equivalent Residential Unit (ERU): 2,500 square feet

Total desired annual revenue for the storm sewer utility: \$1,000,000.00

Sum of ERUs within the utility: 310,000

Amount of 1 ERU: \$3.23

Residential (single or two-family dwelling): 1 ERU/\$3.23/month

Other Properties: \$3.23/month/ERU

The table below depicts hypothetical lot area, impervious lot area, ERUs and fees for various land uses:

Land Use	Total Lot Area	Impervious Lot Area	Total ERUs	Monthly Fee	Annual Fee
Single/two-family dwelling	N/A	2,500 sf	1	\$3.23	\$38.76
Multi-family dwelling (apartment building with 24 units)	3 acres	64,087 sf (1.5 acres)	25	\$80.75	\$969.00
Church	7 acres	93,135 sf (2 acres)	37	\$118.40	\$1,420.80
School	8 acres	192,683 sf (4 acres)	77	\$248.71	\$2,984.52
Shopping Center	46 acres	1,394,968 sf (32 acres)	558	\$1,802.34	\$21,628.08
Manufacturing Facility	37 acres	1,042,899 sf (24 acres)	417	\$1,346.91	\$16,162.92

PHASE 3

Once the Phase 2 rate structure is finalized, the Borough can begin developing a credit system for the storm sewer utility. Credit systems are important because they create incentives for property owners to reduce the amount or improve the quality of stormwater generated on their property. It is not enough to just provide funding for the stormwater management program, property owners need to help manage stormwater at the point it is generated, which means stormwater is treated on-site. Improvements made by property owners reduces the volume of runoff that must be managed by the Borough and thus reduces the overall stormwater management program costs. For example, roof runoff can be directed to a dry well on the property, and depending on the

size, parking lot runoff can also be “disconnected” by draining to a lawn area, rain garden or other on-site infiltration or treatment system. Realistically, all development in the Borough since 2004 that was designed according to the Stormwater Management Ordinance – and incorporates BMPs – could qualify for some type of credit. Development that occurred prior to 2004 could qualify for credit by retrofitting the property with BMPs.

PROPOSED SCHEDULE FOR STORM SEWER UTILITY IMPLEMENTATION

This report is intended to present a sustainable funding approach for the Borough’s stormwater management program for further review and consideration by Town Council. If a storm sewer utility is desired, the recommended schedule for implementation is outlined below:

YEAR 1 AND 2

- Adopt Ordinance establishing storm sewer utility to be managed by the Borough Manager and Land Use and Development Director.
- Hire a Storm Sewer System Manager who will responsible for day-to-day management of the storm sewer utility, storm sewer system and stormwater management program.
- Secure office space, purchase office equipment and vehicle for Storm Sewer System Manager.
- Administer MS4 Permit Minimum Control Measures and implement Chesapeake Bay Pollutant Reduction Plan.
- Enforce the Floodplain Management Ordinance.
- Hire GIS technician and purchase software to analyze impervious cover and establish ERU or hire an engineering firm to conduct the analysis.

YEAR 3 AND 4

- Evaluate storm sewer system maintenance needs and establish a capital improvement program and personnel plan to maintain system and implement program.
- Establish storm sewer utility rate structure based on ERU.
- Hire an engineering firm to establish a program to monitor and model stormwater system flow and recommend strategies to implement BMP's to address problem areas.
- Establish storm sewer utility credit program and Stormwater Credit Manual.
- Evaluate areas prone to flooding and establish corrective measures.
- Consider moving street sweeping and fall leaf collection operation from General Fund to storm sewer utility.

YEAR 5

- Implement rate structure based on ERU.
- Implement credit program.
- Implement capital improvements program.
- Hire personnel necessary to maintain system and implement capital improvements program.

SOURCES

Code of the Borough of Chambersburg, Chapter 251, Stormwater Management

Borough of Chambersburg MS4 Permit

Borough of Chambersburg Chesapeake Bay Pollutant Reduction Plan

Local Government Stormwater Financing Manual: A Process for Program Reform, University of Maryland Environmental Finance Center, 2014

Municipal Storm Water Management, Thomas N. Debo and Andrew J. Reese, Lewis Publishers, 1995

Stormwater Utility District Feasibility Study, Final Report, Bristol, Rhode Island, 2012